DOCUMENT RESUME

ED 358 340 CE 063 920

TITLE	Basic Gasoline Engine Mechanics. Florida Vocational Program Guide.
INSTITUTION	University of South Florida, Tampa. Dept. of Adult and Vocational Education.
SPONS AGENCY	Florida State Dept. of Education, Tallahassee. Div. of Vocational, Adult, and Community Education.
PUB DATE	Jun 91
NOTE	73p.
AVAILABLE FROM	Division of Vocational, Adult, and Community Education, Bureau of Career Development and Educational Improvement, Florida Education Center, Tallahassee, FL 32399-0400 (order no. IE562 BK 91, guide; IE571 BK 91, Career Merit Achievement Plan).
PUB TYPE	Guides - Classroom Use - Teaching Guides (For Teacher) (052)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Articulation (Education); *Auto Mechanics; Behavioral Objectives; *Career Development; Classroom Techniques; Competence; Competency Based Education; Educational Resources; Entry Workers; Job Skills; Postsecondary Education; Program Guides; *Program Implementation; Secondary Education; *Small Engine Mechanics; State Standards; *Student Evaluation; Teaching Methods; Test Items
IDENTIFIERS	Florida

ABSTRACT

This packet contains a program guide and Career Merit Achievement Plan (Career MAP) for the implementation of a basic gasoline engine mechanics program in Florida secondary and postsecondary schools. The program guide describes the program content and structure, provides a program description, lists job titles under the program, and includes a curriculum framework and student performance standards for basic gasoline engine mechanics courses. The curriculum framework outlines major concepts and content, laboratory activities, program specifics, and intended outcomes; the student performance standards guide lists each standard and the behaviors expected to show mastery of each standard. The guide also provides information on the following: program implementation; instructional resources (a listing of 30 print materials and 12 audiovisuals, along with publishers' addresses); facility design for basic gasoline engine mechanics laboratories and classrooms, equipment, safety, maintenance, and liability; and teacher professional development, teacher certification, professional organizations and support services. The Career MAP is a checklist, to be kept by student and teacher, of student progress in the competencies required for entry into jobs in the gasoline engine mechanics field. (KC)

ED358340

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

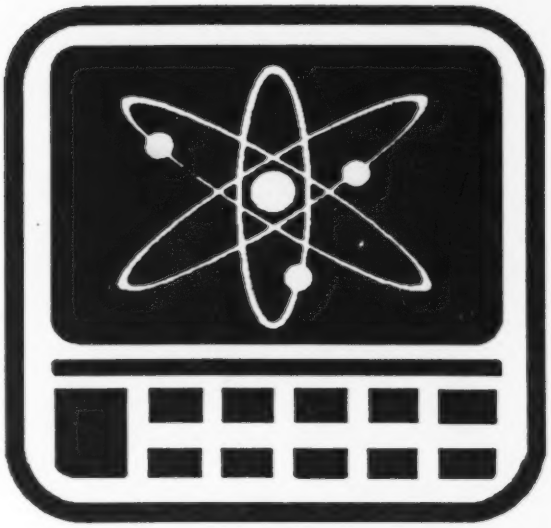
This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."



FLORIDA VOCATIONAL PROGRAM GUIDE FOR BASIC GASOLINE ENGINE MECHANICS

Prepared by

Department of Adult and Vocational Education
College of Education
University of South Florida
Tampa, Florida 33620-7750

State of Florida
Department of Education
Tallahassee, Florida
Betty Castor, Commissioner
Affirmative action/equal opportunity employer

Division of Vocational, Adult, and Community Education
Bureau of Vocational Program and Staff Development

June, 1991

© State of Florida, Department of State, 1991

Authorization for reproduction is hereby granted to the State System of Public Education as defined in 228.041(1), Florida Statutes. No authorization is granted for distribution or reproduction outside the State System of Public Education without prior approval in writing.

ACKNOWLEDGEMENTS

The curriculum for the Gasoline Engine Mechanics program was developed by the Florida Department of Education with assistance from representatives from industry and vocational education instructors. This program guide was compiled by the Department of Adult and Vocational Education at the University of South Florida under the direction of Jack R. Grisham and staff members Karen Childress, Marjorie Stevens and Joan Evans. Appreciation is extended to Jim Hunt of Liberty County High, David McPhaul of James A. Shanks High, Wayne Lanham, Oviedo High and Vernon Leslie of Boyd Anderson High for their contributions.

CONTENTS

Acknowledgements i

Table of Contents iii

Introduction 1

Occupational Description 3

Program Content 5

Curriculum Framework 6
Student Performance Standards 8

Program Implementation 13

Student Admission Criteria 14
Cooperative Education 18
Student Organization Participation 20

Instructional Resources 23

Facilities 33

Facility Design Recommendations 33
Safety, Maintenance and Liability 36

Suggested Equipment List 39

Professional Development 47

Technical Updating and Teacher Standards 47
Related Professional Organizations and Support Services 48

INTRODUCTION

Vocational education meets the needs of students desiring to pursue a selected vocation and is designed to provide training that is realistic in meeting present and future employment opportunities. In recent years, applications of science and technology have expanded rapidly, increasing the education and training required of workers. This has made vocational training programs more attractive as an educational option. The new technologies require well-trained workers to carry out both standardized and specialized procedures, and whose training foundations have given them the capacity to keep pace with continuing technology demands.

The Florida Department of Education shares with business and industry the determination to provide opportunities for upward mobility to as many Floridians as possible. Vocational training programs can keep pace with the demands of new industrial patterns and can provide the opportunity for many of our citizens to gain financial stability and an improved sense of self worth. Therefore, it is necessary to create exemplary vocational programs and to make those programs consistent throughout the state.

This Program Guide identifies primary concerns that should be considered in the organization, operation and evaluation of a vocational education program. It has been developed to provide useful information to local school district and community college administrators, instructors, program advisory committees, regional coordinating councils and others charged with the responsibility of offering vocational education programs.

OCCUPATIONAL DESCRIPTION

A principle occupational title is identified for each vocational training program. This title is validated by the United States Department of Labor Dictionary of Occupational Titles (DOT) or other appropriate references. Such references may be the United States Department of Commerce Standard Occupational Classification Manual (SOC), the Occupational Employment Statistics Survey Dictionary (OES), or Vocational Preparation and Occupations (VPO) prepared by the National and State Occupational Information Coordinating Committees. Information obtained from industry advisory committees may also be used to validate the principle occupational title. The job title and code number for this program are listed in the curriculum framework which accompanies this guide.

The United States Department of Labor Dictionary of Occupational Titles (D.O.T.) identifies the job title for this occupational area as follows:

D.O.T. JOB TITLE	D.O.T. CODE
Gas-Engine Repairer	625.281-026

The definition (description) for this job title is taken from the D.O.T. for easy reference.

GAS-ENGINE REPAIRER (any ind.)

Repairs and maintains gas-driven, internal-combustion engines that power electric generators, compressors, and similar equipment, using handtools and precision-measuring devices: Reads operating reports and diagnoses causes of trouble. Disassembles engines and adjusts or replaces parts, using handtools. Verifies clearances and adjustments, using precision-measuring devices. Reassembles engines and listens to engines in action to detect operational difficulties. May repair air or gas compressors.

PROGRAM CONTENT

The Division of Vocational, Adult, and Community Education, as required by State Board of Education **(S.B.E.) Rule 6A-6.0571**, publishes Vocational Education Program Courses Standards annually. This document specifies the minimum program content for the operation of a vocational training program for the occupational titles listed. Each program identified in the Florida Department of Education Course Code Directory is required to establish course standards. The standards for each vocational offering are comprised of two major components: (1) Curriculum Framework and (2) Student Performance Standards.

Curriculum Framework (CF)

The Curriculum Framework specifies the exact course title, course number, levels of instruction, major course content, laboratory activities, special notes, major course concepts and intended outcomes. The program requirements stipulated in the curriculum framework have been approved by the State Board of Education and are the legal bases for delivery of instruction.

Student Performance Standards (SPS)

The Student Performance Standards are a resource list of job-specific competencies. This list is generated and approved by industry experts and becomes the basis for curriculum development in vocational programs. Local school districts and community colleges must, by law, adopt student performance standards for their vocational programs. They may, at their discretion, adopt the list provided or develop their own as long as there is sufficient content to address each intended outcome. A program may provide instruction beyond the minimum specified in the SPS if desired. The decision to do this should be based on local industry needs. However, the minimum must be presented.

The SPS for secondary level programs contain a third component, course structure. This component specifies the number of courses required for program completion and the content of each course. The courses may be taught in any sequence, but the content may not be changed unless approved by the Division of Vocational, Adult, and Community Education.

The curriculum framework and student performance standards are intended for use as a guide, not a teaching tool. Teachers or curriculum development personnel are expected to develop or select complete curriculum materials for their training programs based on the curriculum framework and student performance standards. Each intended outcome and SPS should be thoroughly analyzed for related cognitive and procedural subskills. The curriculum framework and student performance standards are presented in the following pages.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1991

PROGRAM TITLE: Basic Gasoline Engine Mechanics

CODE NUMBER: Secondary 8766000 Postsecondary _____

Florida CIP 0647.062600

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS _____

APPLICABLE LEVELS(S): __ 7-9 __ 9-12 __ Postsecondary Adult Vocational

__ Postsecondary Vocational __X__ Other 10-12, 30,31

CERTIFICATION COVERAGE: GASENG RPR 7

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to prepare students for employment as small engine specialists (85328638), gas engine repairers (625.281-026). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: basic math skills; reading service manuals; use of microfiche and parts catalogs; use of hand tools, power tools and overhaul tools; servicing and reconditioning of engines; and troubleshooting and repairing of governors, speed controls, lubrication, ignition, fuel, power transfer, cooling exhaust and starting systems.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8766010 Basic Gasoline Engine Mechanics 1
8766020 Basic Gasoline Engine Mechanics 2
8766030 Basic Gasoline Engine Mechanics 3
8766040 Basic Gasoline Engine Mechanics 4
8766050 Basic Gasoline Engine Mechanics 5
8766060 Basic Gasoline Engine Mechanics 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and

employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a workstation which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Apply safety rules and procedures.
02. Identify and properly use laboratory tools and equipment.
03. Demonstrate proficiency in applying customer service skills.
04. Demonstrate proficiency in applying basic mathematics skills.
05. Demonstrate proficiency in repairing and maintaining basic two-stroke cycle engines.
06. Demonstrate proficiency in repairing and maintaining basic four-stroke cycle engines.
07. Diagnose and repair ignition systems.
08. Service fuel systems.
09. Service, repair and adjust engine controls.
10. Repair and service lubrication systems.
11. Service cooling and exhaust systems.
12. Diagnose, service, repair and adjust electrical systems.
13. Service and repair starting systems.
14. Demonstrate proficiency in repairing engine interior components.
15. Demonstrate proficiency in diagnosing and repairing power transfer systems.
16. Demonstrate employability skills.
17. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1991

PROGRAM AREA: Industrial SECONDARY NUMBER: 8766000

PROGRAM TITLE: Basic Gasoline Engine Mechanics POSTSECONDARY NUMBER:

01.0 APPLY SAFETY RULES AND PROCEDURES--The student will be able to:

- 01.01 Practice shop safety rules and procedures.
- 01.02 Practice personal safety rules and procedures.
- 01.03 Practice fire safety rules and procedures.
- 01.04 Practice electrical safety rules and procedures.
- 01.05 Practice air tools safety rules and procedures.
- 01.06 Maintain a clean engine repair shop.

02.0 IDENTIFY AND PROPERLY USE LABORATORY TOOLS AND EQUIPMENT--The student will be able to:

- 02.01 Use general hand tools.
- 02.02 Use special hand tools.
- 02.03 Use precision measuring tools.
- 02.04 Use power tools.
- 02.05 Use fasteners.
- 02.06 Use gaskets and choose sealants.

03.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS--The student will be able to:

- 03.01 Prepare service orders properly.
- 03.02 Communicate solutions to customers.
- 03.03 Locate engine models and types.
- 03.04 Follow manufacturers' service manuals.
- 03.05 Locate parts in a parts catalog or on microfiche.
- 03.06 Complete service or work orders including any warranty information required by the manufacturer.

04.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS SKILLS--The student will be able to:

- 04.01 Read and interpret measuring devices (rules and tapes).
- 04.02 Add 100 addition combinations.
- 04.03 Add two-digit numbers.
- 04.04 Add three-digit numbers.
- 04.05 Subtract 100 subtraction combinations.
- 04.06 Subtract two-, three- and four-digit numbers.
- 04.07 Solve one-digit divisor problems.
- 04.08 Solve two-digit divisor problems.
- 04.09 Solve two- and three-digit divisor problems.
- 04.10 Solve multiplication facts.
- 04.11 Multiply by a one-digit factor.
- 04.12 Multiply by a two-digit factor.
- 04.13 Identify the parts of a fraction.
- 04.14 Solve fractional word problems.
- 04.15 Classify types of fractions.

04.16 Illustrate equivalent fractions.
04.17 Convert fractions.
04.18 Reduce fractions.
04.19 Solve decimal notations.
04.20 Solve number word problems.
04.21 Round to the nearest whole number.
04.22 Add decimals.
04.23 Subtract decimals.
04.24 Multiply decimals.
04.25 Divide a decimal by a decimal
04.26 Divide a whole number by a decimal.
04.27 Write fractions as decimals and percents.
04.28 Write percents as fractions and decimals.
04.29 Solve percent problems.
04.30 Find the percent of a number.
04.31 Operate simple hand-held calculators.
04.32 Understand and use the metric system.
04.33 Convert inches to millimeters and millimeters to inches.

05.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO STROKE CYCLE ENGINES--The student will be able to:

05.01 Explain the basic principles of the operation of the two-stroke cycle internal combustion engine.
05.02 Identify types of engines.
05.03 Locate engine serial and model numbers.
05.04 Identify engine assemblies and systems.
05.05 Disassemble engines.
05.06 Remove, clean and inspect the head for cracks, warpage and damaged spark plug threads.
05.07 Remove, clean and inspect piston rods and assemblies.
05.08 Measure out-of-round piston and cylinder.
05.09 Check the total bearing surface of connecting rod bearings.
05.10 Measure piston skirts and ring grooves.
05.11 Measure the piston ring gap in the cylinder bore.
05.12 Install piston pins according to manufacturer's specifications.
05.13 Check rod and piston assembly alignment.
05.14 Install rings on pistons.
05.15 Install piston rod assemblies.
05.16 Check needle bearings.
05.17 Inspect crankshafts and install seals.
05.18 Inspect, clean and/or replace reed valves.
05.19 Reassemble engines.

06.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES--The student will be able to:

06.01 Explain the basic principles of the operation of the four-stroke cycle internal combustion engine.
06.02 Identify types of four-stroke cycle engines.
06.03 Locate engine serial and model numbers.
06.04 Identify engine assemblies and systems.
06.05 Disassemble engines.
06.06 Clean and inspect heads for cracks, warpage and damaged spark plug threads.
06.07 Inspect valves for warpage, burns, cracks, stem wear,

tip wear and margin.
06.08 Grind valve seats and reface valves.
06.09 Check and inspect springs for free height, distortion and installed height.
06.10 Adjust valve lash.
06.11 Remove and inspect camshafts and lifters.
06.12 Measure camshafts.
06.13 Service camshaft bearings.
06.14 Clean and inspect lifters for wear.
06.15 Time valve drive assemblies.
06.16 Remove piston from rods assemblies.
06.17 Measure out-of-round and cylinder taper with a dial bore gage or micrometer.
06.18 Check piston pins and bosses for wear.
06.19 Measure piston ring lands width, out-of-round and taper.
06.20 Measure the piston ring gap in the cylinder bore.
06.21 Install and fit piston pins.
06.22 Check rod and piston assembly alignment.
06.23 Remove and replace rod bearings.
06.24 Hone and clean cylinders.
06.25 Install rings on pistons.
06.26 Measure and check crankshafts with a micrometer.
06.27 Check for end play.
06.28 Check the bearing bore with a telescoping gage using special tools provided by the engine manufacturer.
06.29 Reassemble engines.
06.30 Install oil seals.

07.0 DIAGNOSE AND REPAIR IGNITION SYSTEMS--The student will be able to:

07.01 Identify and diagnose ignition systems and components.
07.02 Repair magneto ignition systems.
07.03 Repair solid-state ignition systems.
07.04 Repair battery ignition systems.
07.05 Repair impulse ignition systems.
07.06 Identify spark plugs and special applications.
07.07 Remove, adjust and replace spark plugs.
07.08 Adjust ignition system timing.

08.0 SERVICE FUEL SYSTEMS--The student will be able to:

08.01 Service air filters.
08.02 Service or replace fuel filters.
08.03 Service and repair suction-type carburetors.
08.04 Service and repair diaphragm-type carburetors.
08.05 Service and repair float-type carburetors.
08.06 Remove and service fuel supply systems.
08.07 Determine and use correct fuel and fuel mixtures.

09.0 SERVICE, REPAIR AND ADJUST ENGINE CONTROLS--The student will be able to:

09.01 Service, repair and adjust governor speed controls.
09.02 Service, repair and adjust remote speed controls.
09.03 Service, repair and adjust manual start-stop controls.
09.04 Service, repair and adjust electrical start-stop controls.
09.05 Service, repair and adjust zone systems.
09.06 Service, repair and adjust blade clutch controls.
09.07 Service, repair and adjust chain brake systems.
09.08 Comply with the Consumer Protection Act (CPA) for three-second stops.
09.09 Comply with the CPA for interlocks.
09.10 Comply with the CPA for blade tip speed.
09.11 Read and interpret CPA rules and regulations.

10.0 REPAIR AND SERVICE LUBRICATION SYSTEMS--The student will be able to:

10.01 Service crankcase breathers.
10.02 Replace seals and gaskets.
10.03 Identify oil grade terms.
10.04 Identify lubrication systems.
10.05 Identify, understand and relate types and ratios of two-cycle mix oils and their relationship to specific pieces of equipment.

11.0 SERVICE COOLING AND EXHAUST SYSTEMS--The student will be able to:

11.01 Service air cooling fins and screens.
11.02 Service two-cycle exhaust systems.
11.03 Service four-cycle exhaust systems.

12.0 DIAGNOSE, SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS--The student will be able to:

12.01 Operate electrical testing instruments.
12.02 Replace electrical system components.
12.03 Test and service batteries according to manufacturer's requirements and the use of the battery (i.e., motorcycle batteries require a trickle charge at 1.5 amps over a period of 8 hours).
12.04 Diagnose electrical system components.
12.05 Service, repair and adjust charging systems.

13.0 SERVICE AND REPAIR STARTING SYSTEMS--The student will be able to:

13.01 Service and repair manual starting systems.
13.02 Service and repair electrical starting systems.
13.03 Test and service battery starting systems.

14.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS--The student will be able to:

14.01 Service, repair and adjust valve systems.
14.02 Service, repair and adjust rings, bores and pistons.
14.03 Service, repair and adjust crankshafts and bearings.
14.04 Service, repair and adjust rods.
14.05 Service, repair and adjust lubrication systems.
14.06 Service, repair and adjust internal governor.
14.07 Service, repair and adjust internal components timing.
14.08 Assemble complete engines to manufacturer's specifications.

15.0 DEMONSTRATE PROFICIENCY IN DIAGNOSING AND REPAIRING POWER TRANSFER SYSTEMS--The student will be able to:

15.01 Inspect and measure belts and chains.
15.02 Install belts and chains.
15.03 Repair manual transmissions.
15.04 Repair differentials.
15.05 Identify power transfer system components.
15.06 Replace drive components.
15.07 Remove and repair clutches.
15.08 Sharpen and balance blades.
15.09 Remove and replace or install blades correctly.
15.10 Remove and replace hydraulic pump systems.

16.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents that may be required when applying for a job.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make job changes appropriately.
16.09 Demonstrate acceptable employee health habits.
16.10 Demonstrate a knowledge of the "Florida Right-to-Know Law" as recorded in Florida Statutes Chapter 442.

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

17.01 Define entrepreneurship.
17.02 Describe the importance of entrepreneurship to the American economy.
17.03 List the advantages and disadvantages of business ownership.
17.04 Identify the risks involved in ownership of a business.
17.05 Identify the necessary personal characteristics of a successful entrepreneur.
17.06 Identify the business skills needed to operate a small business efficiently and effectively.
17.07 Demonstrate a knowledge of state licensing requirements.

PROGRAM IMPLEMENTATION

It is the teacher's responsibility to ensure that students learn how to competently perform the tasks specified in the course objectives. Therefore, the teacher must lead the students through the learning experiences in a course, motivate students, act as a role model for students, and at times, function as a guidance counselor and placement coordinator. This leadership role requires the teacher to participate in many of the activities required for program implementation. The teacher must select the methods of instruction that best apply to students' ability levels, measure student achievement and provide feedback. Key factors that must be considered when implementing this program are addressed below.

TEACHER CHARACTERISTICS

Subject Knowledge

The teacher must be a subject matter expert who is able to implement sound instructional methods and evaluate student performance. He/she must have significant work experience in the industry/vocational field and be able to communicate that knowledge to the students.

Instructional Delivery

The teacher's role in the learning process is to motivate and lead the student as well as impart subject matter knowledge. In order to maximize student learning, the use of a variety of instructional methods is encouraged. Because teaching styles vary greatly, teachers are highly encouraged to "pick and choose" from various methods or to combine methods for maximum benefit to students. Some of the more traditional methods used are lecture, demonstration and small group instruction. Other teaching methods which are suggested for further exploration include individualized self-paced, open-exit/open-entry, contract, computer based and competency based instruction. The focus of Competency Based Vocational Education (CBVE) is to ensure that each student can competently perform tasks specified before progressing to more complex skills.

CONVENTIONAL INSTRUCTIONAL METHODS

A vocational program may require a portion of the instruction to be presented in a standard lecture or controlled demonstration format. These methods of instruction can be easily combined with instructor controlled step-by-step practical exercises. Some instructional activities may dictate that this instructional approach be used to introduce students to hazardous equipment often utilized in vocational training. In most situations, students should be required to perform specified activities to achieve maximum skill competency. If mastery of a task is required, competency based education methods may be more appropriate. However, if the training activity involves an orientation or a seldom performed, non-essential task, conventional instructional methods may be more effective. Teachers are encouraged to use a variety of instructional methods to best meet instructional objectives.

Instructional Development

Teachers often must develop and select their own teaching and curriculum materials. In developing a comprehensive curriculum, instructional objectives based upon both the performance and cognitive domain must be included. When developing curriculum materials, teachers must use the curriculum framework (CF) and student performance standards (SPS) contained in this program guide as a basis. These materials delineate minimim program content which must be presented for an approved vocational training program. However, they are not intended for use as a comprehensive curriculum. Be certain not to adapt the curriculum to available materials, but select only those materials which can be adapted to the curriculum.

Instructional Measurement

Teachers must select testing methods that support the instructional delivery system used. Teachers must be competent to develop, administer and evaluate written and performance type tests.

Student Admissions Criteria

Providing the student the opportunity to successfully complete a vocational education program, in any institution, should be the primary concern of the instructional effort. Therefore, it is very important to direct planning and effort into identifying and selecting students with excellent potential for success in the educational program and in the occupation. The school's primary task is to prepare people for fulltime, entry-level positions as technicians or, in the case of those with more experience, as managers.

The Course Code Directory, specifies grade levels at which occupational programs are offered. Specific student admissions criteria which are required by the State and local educational agencies for the Basic Gasoline Engine Mechanics training program are illustrated as follows.

SPECIFIC ADMISSIONS CRITERIA

Minimum Age:	As required by state and local policy
Physical Requirements:	None
Special Requirements:	None
Minimum Basic Skills Math Level:	* 10.0
Minimum Basic Skills Language Level:	* 9.0

* This grade level requirement is specified in the Curriculum Framework and is applicable to postsecondary level programs of 450 hours or more only. There is no minimum basic skill requirement for secondary programs.

THE STUDENT PROFILE

Developing a student profile is an important step in program implementation. Attention should focus on student characteristics that can be remediated within a training program, but could create serious impediments to success in the vocational field. Typical of these would be deficiencies in communication and mathematical skills. The basic skill levels can be measured by testing. Test results can then be used to direct the student to more suitable training which matches his or her skill level, or to determine supplemental training which may be required to increase chances for student success.

High school and postsecondary vocational students can be admitted to a vocational program upon request if they meet any specified prerequisites, such as physical or basic skill requirements. Training programs should be accessible to as many students as possible. Training programs are designed to prepare students for employment upon graduation, or serve as prerequisite to a postsecondary program.

The community college can be more selective and establish stringent admission standards. This may be done by assessing applicants or by recruiting potential students who meet the established prerequisite requirements of the training. The program advisory committee can design a profile of the potentially successful student. The profile should contain a

list of qualities, traits and aptitudes that will indicate a higher potential for student success. Acceptable levels for these traits must also be determined. For example, the qualities deserving highest attention, mechanical ability and cognitive aptitude, are those which the educational program itself will not likely be able to influence, although these traits should have considerable weight in establishing the basic profile. Deficiencies in mathematical or communication skills may lend themselves to improvement through related instruction while the student is enrolled in the program. The following example illustrates specific qualities to consider when establishing the student profile:

Mechanic/Technician--Service

- Knowledge of basic tools and equipment used by mechanics/technicians
- Ability to analyze and solve mechanical and technical problems
- Ability to interpret written mechanical/technical materials
- Ability to interpret mechanical/technical drawings
- Mechanical dexterity

Mechanic/Technical Service Management

- Basic application of service
- Business skills
- Ability to work with people
- Communication skills
- Leadership

QUALIFYING AND PRETESTING

Assessing potential students for vocational programs is an integral part of the recruiting process since considerable amounts of time and money will be spent on students entering training. Recruiters must have a good idea of the candidate's basic aptitude. Whoever guides the candidate to the program needs to have knowledge of the student's interests, abilities and experience. These can be measured by a variety of assessment methods, which should be performed upon program entry. The assessment can help determine extent and level of training each individual should receive.

The minimim basic skills requirement for mathematics and language skills is specified on the curriculum framework. Assessment should determine the level at which the student can read, write, calculate mathematics and understand the English language. It is appropriate for the program advisory committee and the school to develop some selection criteria based on minimum skill levels. These criteria should remain flexible in order to maximize educational opportunity for all applicants. Additionally, vocational educators must make every effort to serve the variety of "special needs" students and to eliminate sex-bias and stereotyping in all occupational areas.

ADVISORY COMMITTEE

It is imperative that representatives of industry be organized into an advisory committee. Constantly changing technological demands of our society will continue to stimulate changing industrial patterns. Therefore, effective use of program advisory committees is vital to the successful implementation of vocational training programs. Advisory committees provide expert technical advice which is not easily obtainable elsewhere, offer external support of policies and have tremendous public relations potential.

The most effective advisory committees are those whose members have mutual respect for each other's abilities and vested interest in the training program because of their need for trained workers. The program advisory committee is also one of the most effective means of facilitating placement. Its role can be:

- To contact local industry and encourage them to use the school's placement office as a means of filling jobs
- To develop an effective procedure for interviewing and evaluating potential employees suggested by the school
- To assist in gathering accurate and current job information as it becomes available

COUNSELING AND GUIDANCE

Counseling of students serves two purposes. It guides the student into the program and it supports enrolled students on a continuing basis throughout the program. Much day-to-day counseling will be the responsibility of the teacher. The teacher has the most contact with the student and is in a position to detect and correct a problem. Each student will encounter new problems as the program develops. The teacher's job is to work with the student to help identify problems and then strive for solutions. The teacher will provide much of the counseling that focuses on trade knowledge and skills.

The professional counselor cannot be expected to have the subject matter expertise of the primary teacher. The counselor, however, can focus on the student's needs related to other issues such as personal growth, interests and attitudes. The ideal situation will provide at least one counselor with current knowledge of industry standards for career counseling. A useful tool which should be used in the counseling process is the Career Merit Achievement Plan (Career MAP) which presents minimum instructional content keyed to student performance standards. Career MAPs are available for each industrial program area, and can be used to document student achievement, isolate student interests, talents and weaknesses. They are also useful for placement purposes. Information on Career MAPs may be obtained by contacting the Department of Education, Division of Vocational, Adult, and Community Education, (904) 488-0484.

STUDENT PLACEMENT

Implementing an effective placement system is integral to developing a successful vocational training program. **S.B.E. Rule 229.551 (3)(g)** requires 70 percent placement of students who have completed a vocational training program. Although placement is not always a problem, as with students already working in a related occupation, the placement program should place emphasis upon students who are seeking entry-level employment since these students have little or no experience with industry.

The task of the placement program is to locate job openings in the community. The placement coordinator or teacher must know each student's personal aims and interests in addition to the information stated on the achievement record. In many cases, teachers are the best source to match students to job openings because of their contacts with the industry advisory committee. Input concerning employment openings must come from individual business establishments in the community. The placement coordinator should introduce a student to as many suitable job openings as possible. Conversely, employers can then be expected to interview as many qualified candidates as possible.

Cooperative Education

COOPERATIVE EDUCATION APPLICABILITY

Normally, a student will complete the entire program as a full-time student before obtaining employment as a gasoline engine repairer helper. However, there may be situations where a student could be allowed to complete part of the program while employed as a gasoline engine repairer helper. At this time it is appropriate for the student to enroll in industrial cooperative education (ICE). Guidelines for this training plan are provided in the "Industrial Cooperative Education Program Guide," published by the Division of Vocational, Adult, and Community Education, Order # IE 508 BK 87.

Industrial cooperative education is a method of instruction designed to prepare students for jobs in the community. This method is a joint effort between the school and the business community. Student trainees receive a combination of instruction in the classroom and related on-the-job training through employment. Learning experiences are jointly planned and supervised by the teacher and the employer. Cooperative education is relevant to the needs of the student preparing for a work role, and will help the student to achieve success and personal satisfaction as the transition is made from school to the constantly changing world of work.

Cooperative education is defined in the Federal Register, Volume 39, number 143, Vocational Education, Section 102.96, as a program ". . . to prepare students for employment, through: (a) providing meaningful work experiences combined with formal education enabling students to acquire knowledge, skills, and appropriate attitudes, (b) removing the artificial barriers which separate work and education, (c) involving educators with employers, creating interaction whereby the needs and problems of both are made known, thereby making it possible for occupational curricula to be revised to reflect current needs in various occupations . . . ."

PURPOSE

Cooperative Education is for persons who, through written cooperative arrangements between the school and employers, receive instruction, including required academic courses and related instruction by alternation of study in school with a job in any industrial occupational field. These two experiences must be planned and supervised by the school and employers so that each contributes to the student's education and employability. Work periods and school attendance may be on alternative half days, full days, weeks or other periods of time to fulfill objectives of the cooperative education program.

GOALS AND OBJECTIVES

The primary goal of the cooperative method of vocational education is to prepare skilled, responsible individuals who can assume a productive role in the community. Specific objectives to meet the primary goal are:

- To prepare individuals for employment, adjustment and advancement in specified occupations or occupational areas (primary objective)
- To provide an understanding of the contribution of work to the social and economic welfare of our nation
- To provide students with an understanding and appreciation of the American free enterprise system
- To foster an awareness of the civic, social and moral responsibilities of individuals to society

- To stimulate students' interest in their chosen occupational fields and provide an understanding of the opportunities in each field
- To provide training that results in increased efficiency in performing job tasks
- To provide curriculum which is sensitive and adaptable to changes in occupational practices and procedures as they are affected by societal, economic, technical and educational developments
- To strive to develop a greater appreciation of the value of specifically trained personnel among employers, employees and consumers
- To reinforce skills learned in the school laboratory
- To provide experiences on tools and equipment not available in the school laboratory
- To supplement and broaden the school curriculum into areas not otherwise available

Student Organization Participation

Vocational student organizations operate pursuant to federal and state laws, which authorize them as viable components of vocational education programs. According to federal regulations, the vocational education program of instruction may include activities of vocational student organizations which are an integral part of the vocational instruction offered and which are supervised by vocational education personnel. The **S.B.E.** Rules authorize vocational student organizations as an integral part of the vocational education program as stated in **S.B.E. 6A-6.064 (7)** and **6A-6.065 (8).**

VOCATIONAL INDUSTRIAL CLUBS OF AMERICA (VICA)

VICA is an organization for secondary or postsecondary students enrolled in trade and industrial education programs in high schools, area vocational technical centers and junior and community colleges. It is the only national and international organization for trade and industrial students. The organization is designed to expand and enrich opportunities for leadership, social awareness and civic responsibility in vocational students.

Students who participate in VICA activities are often better prepared for the world of work. They acquire knowledge of the many opportunities available in their chosen careers and become aware of the value of their

contributions to society. They are also given opportunities to develop and utilize their talents and abilities in ways that otherwise would not be available to them.

BENEFITS OF VICA MEMBERSHIP FOR THE STUDENT

Membership in VICA offers the student the opportunity for growth and development in the following areas:

School and Community Service Activities Students in VICA become involved in various school and/or community services. These may include clothing or food collections for the needy, donation of time and service to the elderly and participation in fund raisers or similar activities.

Social Interaction with Fellow Students Activities are also available that offer students time for relaxation and fun. Social activities of this type may be held on a regular basis. They might be held on the school campus during school hours, or off campus after school. More formal functions would include end of the year award banquets or industry/employer appreciation dinner banquets.

Competition in Skill and Leadership Contests VICA offers various contests in all the skill and leadership areas it serves. Often, teachers identify talented students who represent their school in regional competitions. However, any student member of VICA may compete. Instructors should conduct planned contests within their trade areas. This also pertains to leadership areas. First and second place regional winners then move on to the state level contest. The state winners then compete at the national level of the United States Skill Olympics.

INSTRUCTIONAL RESOURCES

STUDENT REFERENCE MATERIALS

Necessary instructional texts or pertinent material should be available for each student to satisfy training objectives. When textbooks are used, the copyright date should be as current as possible.

SERVICE MANUALS

Manuals with current manufacturer's service procedures and specifications should be available. These manuals must be located where students can use them while working in the shop area.

PERIODICALS

Current general and technical magazines and newspapers should be available for student and instructor use.

The following list of suggested resources is organized under each outcome shown in the curriculum framework. These resources have been recommended by instructors and program administrators.

01.0 APPLY SAFETY RULES AND PROCEDURES

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Evinrude/Johnson Outboard Shop Manual Alan Ahlstrand	CLYMER PUBLICATIONS	text
Mercury Outboard Shop Manual Kalton C. Lahue	CLYMER PUBLICATIONS	text
Small Engine Repair Bill Hires, Mark Taylor, Mike Bundy	OKLAHOMA STATE DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION	text
Auto Shop Safety Series BXA20XSV	CAMBRIDGE VOCATIONAL & TECHNICAL	video
Chain Saw Safety 268X-VII	BERGWALL PRODUCTIONS	video
Safety Programs DKVHU87573EN	DEERE & CO.	video
Welding Safety 515X-VII	BERGWALL PRODUCTIONS	video

02.0 IDENTIFY AND PROPERLY USE LABORATORY TOOLS AND EQUIPMENT

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Snap On Tool Catalog	SNAP ON TOOLS CORPORATION	text

03.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Small Engine Know How BG610786	BRODHEAD GARRETT	film
Service and Repair Instruction Manual	BRODHEAD GARRETT	text
Small Gas Engines Alfred C. Roth	GOODHEART-WILLCOX COMPANY, INC.	text

04.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS SKILLS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Outboard Motors Transparency Set BG348426	BRODHEAD GARRETT	transparency
Small Engine Operating Principles	ARTURN MAKIN PRODUCTIONS, INC.	film
Small Engines Explained	BERGWALL PRODUCTIONS	film
Chenier Math Method Norman J. Chenier	CHENIER EDUCATIONAL ENTERPRISES, INC.	text
GED Mathematics Susan D. McClanahan/Donna D. Amstutz	STECK-VAUGHN	text

05.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Heavy Duty Small Engine Overhaul	PRENTICE-HALL, Division of Simon & Schuster	film
Ignition Service for Heavy Duty Small Engines	PRENTICE-HALL MEDIA	film
Small Gasoline Engines George E. Stephenson	DELMAR PUBLISHING	text

06.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Small Engines Explained	BERGWALL PRODUCTIONS	film
Comprehensive Small Engine Repair	MID-AMERICA VOCATIONAL CURRICULUM CONSORTIUM, INC.	module
Small Engine Operation & Service Jay Webster	AMERICAN TECHNICAL PUBLICATIONS, INC.	text

07.0 DIAGNOSE AND REPAIR IGNITION SYSTEMS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
NONE		

08.0 SERVICE FUEL SYSTEMS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE

NONE

09.0 SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE

NONE

10.0 REPAIR AND SERVICE LUBRICATION SYSTEMS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE

NONE

11.0 SERVICE COOLING AND EXHAUST SYSTEMS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE

NONE

12.0 DIAGNOSE, SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE

NONE

13.0 SERVICE AND REPAIR STARTING SYSTEMS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
NONE		

14.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
NONE		

15.0 DEMONSTRATE EMPLOYABILITY SKILLS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
VICA Journal	NATIONAL VICA	magazine
Employability Skills Series (ESS) (CE 001 SS 81)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	module
A Guide to Employability Skills Materials (CE 042 BK 85)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Applying for a Job - Instructor's Guide (CE 004 BK 81)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Applying for a Job - Student Guide (CE 003 BK 79)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text

Choosing an Occupation - Instructor's Guide (CE 010 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Choosing an Occupation - Student Guide (CE 009 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Dictionary of Occupational Titles	U. S. DEPARTMENT OF LABOR EMPLOYMENT AND TRAINING ADMINISTRATION	text
ESS for Success (CE 150 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Employability Skills Leader's Guide: In-service Workshop (CE 205 BK 85)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Employability Skills Participant's Guide: In-service Workshop (CE 074 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Good Work - Instructor's Guide (CE 018 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Good Work - Student Guide (CE 017 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Job Changes - Instructor's Guide (CE 025 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text

Job Changes - Student Guide (CE 024 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Occupational Outlook Handbook	U. S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS	text
Personal Finances - Instructor's Guide (CE 030 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Personal Finances - Student Guide (CE 029 BK 83)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Your Job Search - Instructor's Guide (CE 038 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Your Job Search - Student Guide (CE 037 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
Excellence in Training and Employment Louis E. Tice	PACIFIC INSTITUTE, INC.	video

16.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Working Today and Tomorrow - Instructor's Manual ISBN 0-8219-0191-5	EMC PUBLISHING	text

PUBLISHERS' ADDRESSES

AMERICAN TECHNICAL PUBLICATIONS, INC.
1155 West 175th Street
Honewood, IL 60430

ARTURN MAKIN PRODUCTIONS, INC.
2900 McBride Lane
Santa Rosa, CA 95401

BERGWALL PRODUCTIONS
Post Office Box 238
Garden City, NY 11530

BERGWALL PRODUCTIONS
Post Office Box 238
Garden City, NY 11530

BERGWALL PRODUCTIONS
Post Office Box 238
Garden City, NY 11530

BERGWALL PRODUCTIONS
Post Office Box 238
Garden City, NY 11530

BRODHEAD GARRETT
P.O. Box 8102
Mansfield, OH 44901

BRODHEAD GARRETT
P.O. Box 8102
Mansfield, OH 44901

BRODHEAD GARRETT
P.O. Box 8102
Mansfield, OH 44901

CAMBRIDGE VOCATIONAL & TECHNICAL
P.O. Box 2153, Dept. V03
Charleston, WV 25328

CHENIER EDUCATIONAL ENTERPRISES, INC.
P.O. Box 265
Wells, MI 49894

CLYMER PUBLICATIONS
P.O. Box 4520
Arlita, CA 91333

CLYMER PUBLICATIONS
P.O. Box 4520
Arlita, CA 91333

DEERE & CO.
John Deere Road
Moline, IL 61265

DELMAR PUBLISHING
2 Computer Drive West
Albany, NY 12212

FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION
Knott Building
Tallahassee, FL 32399

GOODHEART-WILLCOX COMPANY, INC.
123 West Taft Drive
South Holland, IL 60473

MID-AMERICA VOCATIONAL CURRICULUM CONSORTIUM, INC.
State Department of Vocational Education
Stillwater, OK 74074

OKLAHOMA STATE DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
State Department of Vocational Education
Stillwater, OK 74074

PRENTICE-HALL MEDIA
90 South Bedford Road
Mt. Kisco, NY 10549

PRENTICE-HALL, Division of
Simon & Schuster
Route 9 West
Englewood Cliffs, NJ 07632

SNAP ON TOOLS CORPORATION
2801 80th Street
Kenosha, WI 53141

STECK-VAUGHN
P.O. Box 2028
Austin, TX 78768

U.S. DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS
Washington, DC 20402

FACILITIES

Facility Design Recommendations

Facilities, tools and equipment are essential parts of training programs, and must be designed to meet State program standard requirements and instructional objectives. This section of the Program Guide contains information for setting up classroom and laboratory facilities. Facility design criteria and space requirements are specified in **S.B.E. Section B, Chapter 6A-2.**

TEACHING FACILITIES

The instructional environment should duplicate, as closely as possible, the real-life work environment the student will enter after graduation. The more the school resembles the industrial environment, the easier it will be for the student to make the transition from school to work. Tools, supplies and equipment should conform to local industry standards. The teacher should actively pursue supplemental resources to expose the students to state-of-the-art equipment.

All facilities should include classroom space, as well as space for regular classroom equipment such as audio-visual equipment. Laboratory facilities should be equipped with work stations or workbenches, tables, chairs and special training aids to demonstrate basic principles and theory. They should contain enough tools and equipment to enable several students to work individually on the same learning activity.

UPDATING FACILITIES

To keep pace with technological changes and improvements, facilities must be updated on a continuing basis. When planning facilities, priority must be to provide space which will fulfill changing needs of the instructional program. Buildings should be designed with flexibility to expand in order to accommodate future program changes and to allow for greater ease of facility updating. The program advisory committee should be used to assist the school in establishing priorities for obtaining facilities, tools and equipment. Careful planning and analysis of current and future needs will lead to the establishment of an effective training environment.

SCHOOL FACILITIES

Basic Gasoline Engine Mechanics

This section of the program guide provides guidelines for Basic Gasoline Engine Mechanics program facilities. All vocational programs must meet additional facility requirements specified in **S.B.E. Section B, Chapter 6 A-2.**

The classroom/laboratory areas should be designed to accommodate oversized machinery, equipment, materials and holding tables. Each area should be equipped with special lighting, as necessary. The area should provide oversized openings equipped with service entry doors to the movement and transporting of oversized equipment, materials and products.

The laboratory should include electrical outlets providing 110 volts at each work station. Electrical outlets should be permanently mounted to the work station benches. Additional electrical outlets should be installed along the walls and in the center areas of the laboratory. Electrical outlets in the center areas should be mounted on posts between the ceiling and work stations or on pull down extension systems. Special electrical wiring may be required to supply the power requirements of specialized equipment. All electrical service must be installed according to local building code requirements.

CLASSROOM/LABORATORY FACILITIES

Space requirements for **new** facility construction for this program are specified in **S.B.E. Rule 6A-2.032** as shown below.

NEW FACILITIES
BASIC GASOLINE ENGINE MECHANICS

Occupant Design Stations	20
Net Square Feet Per Occupant	
Minimum	90
Normal	95
Maximum	99
Total Net Square Feet	
Minimum	1800
Normal	1900
Maximum	1980

WORK STATION ARRANGEMENT

The arrangement of work stations and specialized equipment depends upon t general layout of the facilities, but careful consideration must be given to convenience to entrances and exits, easy movement among work stations and tool/storage areas. The area should have a counter convenient to work stations. Overall layout of the facility should be planned so that the location of entrances and exits permits a logical flow of work in progress. One of the most critical factors in planning a facility is the arrangement of work stations to obtain a safe, efficient traffic pattern.

ADDITIONAL FACILITY CONSIDERATIONS

Training Stations

Training stations and live work areas must be available in the type and number required to meet program goals and performance objectives.

Instructional Area

A classroom or designated area of the laboratory should be available for lecture, instruction, viewing audio visual materials and other nonshop activities.

Personal Tool/Equipment Storage Area

A secure storage room or area should be provided, with enough shelf space for student supplies/tool boxes and floor space for equipment.

General Storage

Storage areas for tools, parts, supplies and machines must be sufficient to support the activities outlined in the program goals and performance objectives.

Office Space

An area separate from the classroom and laboratory should be available and convenient for use by the instructor(s) as an office.

Maintenance

A regular facilities maintenance program must be implemented to ensure tha equipment and facilities are safe and usable to meet instructional needs.

Housekeeping

The classroom, laboratory and support area(s) must be kept clean and orderly.

Ventilation

A fume/dust removal system should be in place and operable. When appropriate, heating and cooling systems should be used to provide sufficient comfort for learning. Ventilation requirements are stated in **S.B.E. Rule 6A-2.066.**

First Aid

A first aid station must be in place, well marked and complete with appropriate supplies.

Support Facilities

Restrooms, clean-up areas and lockers convenient to the shop should be available for students.

Safety

The facilities must meet all Occupational Safety and Health Administration (OSHA) safety standards, where applicable.

Facility Evaluation

The program advisory committee should be asked to conduct an annual evaluation of the facilities to insure the program's continuing capability to meet instructional objectives.

Safety, Maintenance and Liability

SAFETY

S.B.E. Rule 6A-2.097

The Florida State Board of Education establishes rules for the operation of public schools. **Part III, Section B, Chapter 6A-2** of the State Board of Education Rules contains the standards for existing educational facilities. Subsections deal with the entire school facility in regard to such topics as electrical equipment, flammable materials, ventilation, fire safety, storage and illumination. Subsection 6A-2.097 contains safety regulations pertaining to vocational classes.

The statute requires 100 percent protection of every student and teacher participating in laboratory work wherein the type of activities listed in the statute above are conducted. This will include: demonstration by teachers or students, students and teachers present in a room or laboratory when students are engaged in make-up work or project work, and when anyone is using tools for construction or repair work involving the shaping or cutting of any solid materials.

Rules and regulations for an eye protection program should be organized and distributed to teachers, students and school personnel. Safety devices should be worn by those participating in the activity and by those who are observers or who may be in close proximity.

Marking of Hazardous Areas

Floors, walls, posts, stationary objects, machinery and equipment should be properly painted, marked, coded or identified, according to recommended safety practices of OSHA, the school board and industry.

Emergency Procedure For Injuries

The following procedures are recommended in the event of an injury or sudden illness in a student:

- Refer to the red "fire or medical emergency" signs posted in appropriate areas.
- Provide immediate first aid if so qualified.
- Notify appropriate personnel to advise them of the problem. They can also contact emergency trained personnel on campus.
- A conscious person has the right to refuse treatment and/or transportation to a medical facility.
- Advise students that they will be financially responsible for ambulance and emergency care.
- The paramedics will assume patient care upon arrival.
- If emergency transportation is not indicated, the student may spend time at the clinic, be allowed to go home or go to a medical facility.
- Be sure to complete the appropriate student injury form for any and all accidents or sudden illness.

MAINTENANCE

Schools should have the necessary facilities for routine maintenance. Special maintenance requirements for this program concern the hand and pow tools and machines. Arrangements must be made to accomplish routine and non-routine maintenance of hand and power tools and cutting and shaping machines. Arrangements can be made through the school's shop or an outsi agency.

VOCATIONAL TEACHER LIABILITY

Liability of Teacher and School Board

Negligence of vocational education teachers can cause unnecessary injury, and may result in teacher and school district liability. Vocational teachers are recommended to carry personal liability insurance. To reduce the risk of liability and injuries, the following suggestions are provided.

- Follow accepted policies of the school board.
- Do not allow students to use equipment or tools which have not been approved by the administration and Board of Education.
- Establish safety rules and enforce them.
- Do not leave the shop/laboratory while students are working.
- Do not permit non-enrolled students to use the shop/laboratory.
- Do not allow students to use machines or tools for which instruction has not been given.
- Do not approve unsupervised student activities inside or outside the shop/laboratory.
- Prepare accident forms for all accidents.
- Regularly inspect the workplace and equipment for defects or potential hazards and maintain documentation of unserviceable or hazardous items.
- Consider age, maturity, skill and ability of students when providing instruction and supervision.
- Administer safety tests to students upon completion of the demonstration of a specific machine, tool or process and keep documentation on file in your office.
- Require all students to wear eye protection devices, when appropriate, for laboratory activities.

SUGGESTED EQUIPMENT LIST

General Classroom Equipment

DESCRIPTION

Chalkboard

Bulletin board

Bookcases

Cabinet-storage

Student study stations

Audio-visual equipment as needed

Laboratory Tools and Equipment

These tools and items of equipment are normally used in this program. Equipment items are listed under each outcome, corresponding to the curriculum framework. Consumable supplies should be readily available to assure continuous instruction. Consumable supplies such as solder and wire are not contained in the equipment list.

01.0 APPLY SAFETY RULES AND PROCEDURES

DESCRIPTION

Air bench
Brooms, mops, buckets
Face shield
Fire extinguishers
Fuel storage safety can (2 gal.)
Pressure cleaner
Safety glasses
Shop clean up equipment

Visual aid equipment
Waste oil container
Wet cell battery

02.0 IDENTIFY AND PROPERLY USE LABORATORY TOOLS AND EQUIPMENT

DESCRIPTION

Acetylene torch set
Air compressor
Air hose adapter, male/female
Air line internal filter
Air tools, various
Air wrench
Basic power tools
Bench grinder
Calipers, various
Chisels
Drill press
Electric drills
Drill bit sets
Hammers
Hand tool cabinets
Heavy duty air hose
Mechanics tool set
Micrometers
Multimeter
Ratchet set, 1/4" drive Rivet gun and rivets
Soldering guns
Solvent cleaning tank
Spark plug cleaner
Special tool kits
Tool box
Valve refacer
Welding equipment, ARC welder, welding truck
Welding truck
Wheel dresser

03.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS

DESCRIPTION

ESA work order forms

Engine
Equipment service manuals
Microfiche
OEM charts of gaskets and sealants
Parts and service manuals, various manufacturers
VHS tape machine

04.0 DEM0STRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS SKILLS

DESCRIPTION

Bore gages
Calculators
Dial indicators
Feeler gages
Measuring equipment
RPM gages
Tachometer
Thread repair equipment

05.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES

DESCRIPTION

Air pressure blow gun
Compression gage
Electric engraver
Engine rebuilding equipment
Flywheel holders
Hacksaws
Hand drill, 1/2"
Hand drill, 3/8"
Nut splitter
Parts cleaning brushes
Ring compressors
Special clutch wrenches
Steel stamping set
Steel wire brushes
Surface plate
Tap and die set (U.S.)
Tap and die set (metric)
Torque wrenches
Two-cycle engine for each student

06.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES

DESCRIPTION

Arber press
Cylinder service set
Four-cycle engine for each student
Horizontal shaft engine
Light probe, 12 volt
Piston ring expander
Plastic gage
Pneumatic hammer set
Pneumatic nut turn set
Puller set
Punch and chisel set
Sandblasters
Seal protection kit
Seal removers and installers
Special parts cleaning tools
Stud extractor kit
Valve grinder
Valve guide cutters
Valve lapping tools
Valve reconditioning set
Valve seat cutters
Valve spring compressor
Vertical shaft engine
Wrench set, metric

07.0 DIAGNOSE AND REPAIR IGNITION SYSTEMS

DESCRIPTION

Coil tester
Growler
High pressure washer
Ignition analyzer, Sun and Mercotronic
Ohm meter
Spark plug tester
Telescoping gage

08.0 SERVICE FUEL SYSTEMS

DESCRIPTION

Carburetors
Float gages
Fuel pressure gage
Gas hose pliers
Main bearing tool kit
Oil measuring canister
Timing light
VOA meter

09.0 SERVICE, REPAIR AND ADJUST ENGINE CONTROLS

DESCRIPTION

Blade brake monitor
Blade speed monitor
Micrometer, English
Piston ring compressor
Starter clutch wrench
Universal dial indicator test set
Vernier calipers
Z link tool

10.0 REPAIR AND SERVICE LUBRICATION SYSTEMS

DESCRIPTION

Lubrication equipment

11.0 SERVICE COOLING AND EXHAUST SYSTEMS

DESCRIPTION

Flywheel puller

12.0 SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS

DESCRIPTION

Ammeter
Battery charger
Battery hydrometer
Battery tester
Hydrometer
Volt meter
Wire connector kit

13.0 SERVICE AND REPAIR STARTING SYSTEMS

DESCRIPTION

Continuity light
Starter spring rewind tool
Starter clutch wrench
Flywheel holder

14.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS

DESCRIPTION

NONE

15.0 DEMONSTRATE PROFICIENCY IN DIAGNOSING AND REPAIRING POWER TRANSFER SYSTEMS

DESCRIPTION

Belt measuring tool
Blade balancer
Chain breaker & spinner

16.0 DEMONSTRATE EMPLOYABILITY SKILLS

DESCRIPTION

NONE

17.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

DESCRIPTION

NONE

PROFESSIONAL DEVELOPMENT

Teacher Technical Updating

Technical updating workshops are scheduled periodically throughout the State, usually in the summer months. Teachers should take advantage of the opportunity to attend the Basic Gasoline Engine Mechanics program technical update workshops when they are held. All instructional staff are encouraged to participate in as many training opportunities as possible.

Teachers should seek opportunities with local companies to maintain currency with industry trends. During periods when school is not in session, teachers are encouraged to make arrangements to return to industry for suitable involvement in their area of expertise.

Membership in professional associations offers vocational educators an enormous range of opportunities for working together to strengthen the field and to develop personal competence and satisfaction in work. The associations have similar goals and activities. They seek excellence in program content by means of joint efforts among members, communications that keep members current, forums for the discussion of issues in the field, useful and stimulating publications and sound professional growth experiences at local, state, regional and national meetings and annual conventions. They are concerned with increasing public understanding and support of the field. Teachers are encouraged to maintain affiliation with professional organizations. A list of professional organizations follows this section of the guide.

Teacher Standards

As a prerequisite to certification, teachers must have the required years of experience in the appropriate technical field as defined in the certification standards. For the Basic Gasoline Mechanics program, the requirements are six years continuous experience in gasoline engine mechanics. The teacher is then judged qualified to teach upon meeting one of the following criteria: (1) regular or temporary Florida teacher's certificate with appropriate coverage, (2) Approval of local school board consistent with adopted school policy or (3) regular or temporary Florida teacher's certificate with other than appropriate coverage (has met all occupational experience requirements prescribed as a prerequisite to appropriate certification and has been approved by the school board to teach out-of-field). Refer to the Curriculum Framework for this program to determine the appropriate occupational specialization coverage required for certification.

Instructional staff must have technical competency and meet all State and local requirements for certification. Instructors should hold current, nationally recognized certification in the subject areas taught, if awarded. Beginning teachers must be enrolled in the State Beginning Teacher Program.

A systematic method of obtaining "substitute" instructors, approved by the school board, should be used to assure instructional continuity. An orientation session for substitutes should be held on a regular basis. The substitute should be a competent instructor in the occupational area and specific competencies taught.

Professional Organizations and Support Services

EDUCATION ORGANIZATIONS

AMERICAN VOCATIONAL ASSOCIATION (AVA)
1410 King Street
Alexandria, VA 22314
800-826-9972

FLORIDA ASSOCIATION FOR TRADE AND INDUSTRIAL EDUCATION, INC. (FATIE)
Florida Department of Education
Industrial Education - Vocational Division
Knott Building
Tallahassee, FL 32399
904-488-0484

FLORIDA VOCATIONAL ASSOCIATION (FVA)
1420 North Paul Russell Road
Tallahassee, FL 32399
904-878-6860

FLORIDA VOCATIONAL INDUSTRIAL CLUBS OF AMERICA (VICA)
Florida Department of Education
Knott Building
Tallahassee, FL 32399
904-488-0484

TRADE ORGANIZATIONS

This list contains trade associations and technical societies. Many offer training programs of some sort, either directly or through their member companies. Specific details should be requested in writing.

ENGINE SERVICE ASSOCIATION, INC.
1900 Arch Street
Philadelphia, PA 19103

State of Florida
Department of Education
Tallahassee, Florida
Betty Castor, Commissioner
Affirmative action/equal opportunity employer

IE562 BK-91

CAREER MERIT ACHIEVEMENT PLAN
(CAREER MAP)

BASIC GASOLINE ENGINE MECHANICS

(0847.062600)

STUDENT'S NAME

State of Florida

An affirmative action/equal opportunity employer

DEPARTMENT OF EDUCATION
Betty Castor, Commissioner of Education

DIVISION OF VOCATIONAL, ADULT AND COMMUNITY EDUCATION
Robert S. Howell, Director

DEVELOPED BY:
University of South Florida
Department of Adult and Vocational Education

INDUSTRY-BASED PARTNERSHIP PROGRAMS: The State of Florida is committed to the development of industry-based partnership programs, designed by education and industry to respond to industry's demand for a highly skilled work force.

ACKNOWLEDGEMENTS

The curriculum for the Basic Gasoline Engine Mechanics program was developed by the Florida Department of Education with assistance from representatives from industry and vocational education instructors.

For further information, contact
Bureau of Vocational Program and Staff Development
Division of Vocational, Adult, and Community Education
Department of Education
Knott Building
Tallahassee, FL 32399

©State of Florida, Department of State, 1991

Authorization for reproduction is hereby granted to the State System of Public Education as defined in 228.041(1), Florida Statutes. No authorization is granted for distribution or reproduction outside the State System of Public Education without prior approval in writing.

CONTENTS

ACKNOWLEDGEMENTS. i
IDENTIFICATION PAGE. 2
JOB TITLES. 2
OVERVIEW. 3
PURPOSE OF THE MAP. 3
HOW TO USE THE MAP. 3
RATING STUDENT PERFORMANCE STANDARDS. 4
BASIC GASOLINE ENGINE MECHANICS PROGRAM CONTENTS. 5
01.0 APPLY SAFETY RULES AND PROCEDURES. 5
02.0 IDENTIFY AND PROPERLY USE LABORATORY TOOLS AND EQUIPMENT. 5
03.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS. 6
04.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS SKILLS. 6
05.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES. 8
06.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES. 9
07.0 DIAGNOSE AND REPAIR IGNITION SYSTEMS. 10
08.0 SERVICE FUEL SYSTEMS. 11
09.0 SERVICE, REPAIR AND ADJUST ENGINE CONTROLS. 12
10.0 REPAIR AND SERVICE LUBRICATION SYSTEMS. 12
11.0 SERVICE COOLING AND EXHAUST SYSTEMS. 13
12.0 DIAGNOSE, SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS. 13
13.0 SERVICE AND REPAIR STARTING SYSTEMS. 14
14.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS. 14
15.0 DEMONSTRATE PROFICIENCY IN DIAGNOSING AND REPAIRING POWER TRANSFER SYSTEMS. 15
P.O.W.E.R. SKILLS (PRINCIPLES OF WORK ENVIRONMENT READINESS). . . . 17
0. DEMONSTRATE EMPLOYABILITY SKILLS. 17
00. DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP. . . 17
000. COOPERATIVE WORK EXPERIENCE COMPETENCIES. 18
VERIFICATION. 19
COOPERATIVE WORK EXPERIENCE. 20
NOTES. 21

THIS MERIT ACHIEVEMENT PLAN RECORDS THE BASIC GASOLINE ENGINE MECHANICS ACHIEVEMENTS OF:

Student's Name _____

Student ID Number _____

Student's Address _____

_____

Initial Instructor _____

School _____

Date Started _____

PRIMARY JOB TITLE(S) FOR BASIC GASOLINE ENGINE MECHANICS

- Small Engine Specialist OES#(85328638)
- Gas Engine Repairers DOT#(625.281-026)

Program completers qualify for the primary job title(s) listed above. Related job titles may be added based on those job titles found in industry and/or the Dictionary of Occupational Titles.

OVERVIEW

This Career MAP includes the competencies required for entry into the field of gasoline engine mechanics. Business and industry representatives have recommended that students in this field master these competencies in order to become employable. Local education agencies (LEAs) may adapt these competencies to meet their workforce needs.

PURPOSE OF THE MAP

The purposes of the MAP are: to display the student performance standards (SPS) required by the LEA and to document the level of achievement on student performance standards that the student demonstrates.

HOW TO USE THE MAP

Administrator and Instructor. The administrator and instructor can use Career MAPs in curriculum planning, program updating and improvement and teacher recruitment, selection and updating. If the LEA changes or adds student performance standards, the revised or additional student performance standards should be included in the blank boxes that appear within each intended outcome or at the end of this MAP.

Instructor. The instructor can use Career MAPs to keep track of student progress on student performance standards. By periodically reviewing the ratings on student performance standards, the instructor can identify a student's strengths and weaknesses and, on that basis, identify the skills for which the student needs remedial instruction or advanced training. The MAP can also be useful in student counseling and evaluation.

Co-op Instructor/Employer. The employer who sponsors a co-op program should use the Career MAP for keeping a record of the student's performance on appropriate standards. The MAPs will also help the co-op instructor/employer in counseling and evaluating the student.

Student. The student may use the MAP to show potential employers the performance standards he or she has mastered. In order to present a complete record, the student should encourage the instructor/co-op employer to rate his or her level of achievement on all the appropriate student performance standards and to fill in the verification form/cooperative work experience page in the back of this MAP.

Employer. The MAP shows an employer the student performance standards mastered by the student (a prospective employee) and the proficiency level achieved on each student performance standard. This information can help the employer make decisions about hiring, job assignments and job-training needs.

RATING STUDENT PERFORMANCE STANDARDS

Performance Competencies. Ratings on student performance standards should be based upon business/industrial performance standards. The evaluator observes and evaluates student performance as he or she would in the role of the employer or supervisor.

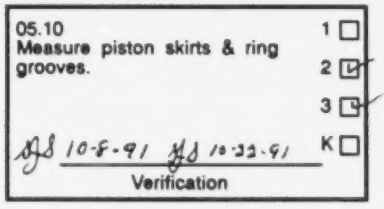
For each skill listed the learner receives a rating of 1, 2 or 3. Each rating indicates a particular level of achievement:

1 = Learner demonstrates knowledge and understanding of this student performance standard, but is not yet able to apply that knowledge or understanding.

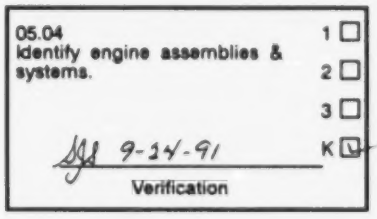
2 = Learner performs this student performance standard satisfactorily with only periodic supervision.

3 = Learner performs this student performance standard satisfactorily without supervision.

Whenever a performance standard is demonstrated, the instructor checks the appropriate rating box (1, 2 or 3) and initials and dates the verification line. If the student later demonstrates a higher level of achievement on a performance competency, the instructor checks the higher level and then enters his or her initials and the new date on the verification line, as shown in the following example:



Knowledge Competencies. For each SPS that is a knowledge competency only, with no manipulative skill involved, only one level of achievement is possible. If the student masters the competency, he or she receives a check in the bottom box ("K"), as shown below:



NOTE: A student performance standard without a checked rating indicates that the learner has not mastered the standard from lack of either ability, time, opportunity or need (the student's area of specialization may not have required it).

01.0 APPLY SAFETY RULES AND PROCEDURES.

01.01 Practice shop safety rules & procedures. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	01.02 Practice personal safety rules & procedures. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	01.03 Practice fire safety rules & procedures. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
01.04 Practice electrical safety rules & procedures. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	01.05 Practice air tools safety rules & procedures. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	01.06 Maintain a clean engine repair shop. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

02.0 IDENTIFY AND PROPERLY USE LABORATORY TOOLS AND EQUIPMENT.

02.01 Use general hand tools. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	02.02 Use special hand tools. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	02.03 Use precision measuring tools. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
02.04 Use power tools. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	02.05 Use fasteners. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	02.06 Use gaskets & choose sealants. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

03.0 DEMONSTRATE PROFICIENCY IN APPLYING CUSTOMER SERVICE SKILLS.

03.01 Prepare service orders properly. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	03.02 Communicate solutions to customers. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	03.03 Locate engine models & types. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
03.04 Follow manufacturers' service manuals. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	03.05 Locate parts in a parts catalog or on microfiche. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	03.06 Complete service or work orders including any warranty information required by the manufacturer. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

04.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS SKILLS.

04.01 Read & interpret measuring devices (rules & tapes). 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.02 Add 100 addition combinations. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.03 Add two-digit numbers. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
04.04 Add three-digit numbers. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.05 Subtract 100 subtraction combinations. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.06 Subtract two-, three- & four-digit numbers. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
04.07 Solve one-digit divisor problems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.08 Solve two-digit divisor problems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.09 Solve two- & three-digit divisor problems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

04.10 Solve multiplication facts. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.11 Multiply by a one-digit factor. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.12 Multiply by a two-digit factor. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
04.13 Identify the parts of a fraction. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.14 Solve fractional word problems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.15 Classify types of fractions. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
04.16 Illustrate equivalent fractions. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.17 Convert fractions. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.18 Reduce fractions. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
04.19 Solve decimal notations. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.20 Solve number word problems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.21 Round to the nearest whole number. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
04.22 Add decimals. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.23 Subtract decimals. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.24 Multiply decimals. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
04.25 Divide a decimal by a decimal. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.26 Divide a whole number by a decimal. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.27 Write fractions as decimals & percents. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
04.28 Write percents as fractions & decimals. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.29 Solve percent problems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.30 Find the percent of a number. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
04.31 Operate simple hand-held calculators. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.32 Understand & use the metric system. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	04.33 Convert inches to millimeters & millimeters to inches. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

05.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC TWO-STROKE CYCLE ENGINES.

05.01 Explain the basic principles of the operation of the two-stroke cycle internal combustion engine. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.02 Identify types of engines. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.03 Locate engine serial & model numbers. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
05.04 Identify engine assemblies & systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.05 Disassemble engines. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.06 Remove, clean & inspect the head for cracks, warpage & damaged spark plug threads. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
05.07 Remove, clean & inspect piston rods & assemblies. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.08 Measure out-of-round piston & cylinder. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.09 Check the total bearing surface of connecting rod bearings. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
05.10 Measure piston skirts & ring grooves. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.11 Measure the piston ring gap in the cylinder bore. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.12 Install piston pins according to manufacturer's specifications. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
05.13 Check rod & piston assembly alignment. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.14 Install rings on pistons. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.15 Install piston rod assemblies. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
05.16 Check needle bearings. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.17 Inspect crankshafts & install seals. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	05.18 Inspect, clean and/or replace reed valves. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

05.19 Reassemble engines. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.0 DEMONSTRATE PROFICIENCY IN REPAIRING AND MAINTAINING BASIC FOUR-STROKE CYCLE ENGINES.

06.01 Explain the basic principles of the operation of the four-stroke cycle internal combustion engine. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	06.02 Identify types of four-stroke cycle engines. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	06.03 Locate engine serial & model numbers. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
06.04 Identify engine assemblies & systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	06.05 Disassemble engines. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	06.06 Clean & inspect heads for cracks, warpage & damaged spark plug threads. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
06.07 Inspect valves for warpage, burns, cracks, stem wear, tip wear & margin. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	06.08 Grind valve seats & reface valves. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	06.09 Check & inspect springs for free height, distortion & installed height. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
06.10 Adjust valve lash. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	06.11 Remove & inspect camshafts & lifters. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	06.12 Measure camshafts. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
06.13 Service camshaft bearings. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	06.14 Clean & inspect lifters for wear. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	06.15 Time valve drive assemblies. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.16 Remove piston from rods assemblies. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.17 Measure out-of-round & cylinder taper with a dial bore gage or micrometer. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.18 Check piston pins & bosses for wear. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.19 Measure piston ring lands width, out-of-round & taper. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.20 Measure the piston ring gap in the cylinder bore. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.21 Install & fit piston pins. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.22 Check rod & piston assembly alignment. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.23 Remove & replace rod bearings. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.24 Hone & clean cylinders. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.25 Install rings on pistons. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.26 Measure & check crankshafts with a micrometer. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.27 Check for end play. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.28 Check the bearing bore with a telescoping gage using special tools provided by the engine manufacturer. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.29 Reassemble engines. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

06.30 Install oil seals. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

1 ☐ 2 ☐ 3 ☐ K ☐ Verification

1 ☐ 2 ☐ 3 ☐ K ☐ Verification

1 ☐ 2 ☐ 3 ☐ K ☐ Verification

07.0 DIAGNOSE AND REPAIR IGNITION SYSTEMS.

07.01 Identify & diagnose ignition systems & components. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

07.02 Repair magneto ignition systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

07.03 Repair solid-state ignition systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

07.04 Repair battery ignition systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	07.05 Repair impulse ignition systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	07.06 Identify spark plugs & special applications. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
07.07 Remove, adjust & replace spark plugs. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	07.08 Adjust ignition system timing. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

08.0 SERVICE FUEL SYSTEMS.

08.01 Service air filters. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	08.02 Service or replace fuel filters. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	08.03 Service & repair suction-type carburetors. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
08.04 Service & repair diaphragm-type carburetors. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	08.05 Service & repair float-type carburetors. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	08.06 Remove & service fuel supply systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
08.07 Determine & use correct fuel & fuel mixtures. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

09.0 SERVICE, REPAIR AND ADJUST ENGINE CONTROLS.

09.01 Service, repair & adjust governor speed controls. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	09.02 Service, repair & adjust remote speed controls. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	09.03 Service, repair & adjust manual start-stop controls. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
09.04 Service, repair & adjust electrical start-stop controls. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	09.05 Service, repair & adjust zone systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	09.06 Service, repair & adjust blade clutch controls. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
09.07 Service, repair & adjust chain brake systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	09.08 Comply with the Consumer Protection Act (CPA) for three-second stops. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	09.09 Comply with the CPA for interlocks. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
09.10 Comply with the CPA for blade tip speed. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	09.11 Read & interpret CPA rules & regulations. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

10.0 REPAIR AND SERVICE LUBRICATION SYSTEMS.

10.01 Service crankcase breathers. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	10.02 Replace seals & gaskets. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	10.03 Identify oil grade terms. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification

10.04 Identify lubrication systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	10.05 Identify, understand & relate types & ratios of two-cycle mix oils & their relationship to specific pieces of equipment. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

11.0 SERVICE COOLING AND EXHAUST SYSTEMS.

11.01 Service air cooling fins & screens. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	11.02 Service two-cycle exhaust systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	11.03 Service four-cycle exhaust systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

12.0 DIAGNOSE, SERVICE, REPAIR AND ADJUST ELECTRICAL SYSTEMS.

12.01 Operate electrical testing instruments. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	12.02 Replace electrical system components. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	12.03 Test & service batteries according to manufacturer's requirements & the use of the battery. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
12.04 Diagnose electrical system components. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	12.05 Service, repair & adjust charging systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

13.0 SERVICE AND REPAIR STARTING SYSTEMS.

13.01 Service & repair manual starting systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	13.02 Service & repair electrical starting systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	13.03 Test & service battery starting systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

14.0 DEMONSTRATE PROFICIENCY IN REPAIRING ENGINE INTERIOR COMPONENTS.

14.01 Service, repair & adjust valve systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.02 Service, repair & adjust rings, bores & pistons. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.03 Service, repair & adjust crankshafts & bearings. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
14.04 Service, repair & adjust rods. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.05 Service, repair & adjust lubrication systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.06 Service, repair & adjust internal governor. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
14.07 Service, repair & adjust internal components timing. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	14.08 Assemble complete engines to manufacturer's specifications. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

15.0 DEMONSTRATE PROFICIENCY IN DIAGNOSING AND REPAIRING POWER TRANSFER SYSTEMS.

15.01 Inspect & measure belts & chains. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.02 Install belts & chains. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.03 Repair manual transmissions. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
15.04 Repair differentials. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.05 Identify power transfer system components. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.06 Replace drive components. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
15.07 Remove & repair clutches. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.08 Sharpen & balance blades. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.09 Remove & replace or install blades correctly. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
15.10 Remove & replace hydraulic pump systems. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

0.0 DEMONSTRATE EMPLOYABILITY SKILLS.

0.01 Conduct a job search. 1 2 3 K Verification	0.02 Secure information about a job. 1 2 3 K Verification	0.03 Identify documents that may be required when applying for a job. 1 2 3 K Verification
0.04 Complete a job application form correctly. 1 2 3 K Verification	0.05 Demonstrate competence in job interview techniques. 1 2 3 K Verification	0.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons. 1 2 3 K Verification
0.07 Identify acceptable work habits. 1 2 3 K Verification	0.08 Demonstrate knowledge of how to make job changes appropriately. 1 2 3 K Verification	0.09 Demonstrate acceptable employee health habits. 1 2 3 K Verification

00.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP.

00.01 Define entrepreneurship. 1 2 3 K Verification	00.02 Describe the importance of entrepreneurship to the American economy. 1 2 3 K Verification	00.03 List the advantages & disadvantages of business ownership. 1 2 3 K Verification
00.04 Identify the risks involved in ownership of a business. 1 2 3 K Verification	00.05 Identify the necessary personal characteristics of a successful entrepreneur. 1 2 3 K Verification	00.06 Identify the business skills needed to operate a small business efficiently & effectively. 1 2 3 K Verification
1 2 3 K Verification	1 2 3 K Verification	1 2 3 K Verification

P.O.W.E.R. SKILLS (PRINCIPLES OF WORK ENVIRONMENT READINESS)

000.0 COOPERATIVE WORK EXPERIENCE COMPETENCIES.

1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

VERIFICATION

The instructor should verify the level of mastery achieved by the student by initialing the competency box each time the student masters a competency. Later, if the student achieves a higher degree of mastery of a competency, the higher degree should be recorded and verified by the instructor.

INSTRUCTOR SHOULD SIGN FULL NAME AND SCHOOL NAME AND ADDRESS IN THE SPACE BELOW.

_____ Verification	_____ Signature _____ Title _____ School Name _____ School Address _____
_____ Verification	_____ Signature _____ Title _____ School Name _____ School Address _____
_____ Verification	_____ Signature _____ Title _____ School Name _____ School Address _____

COOPERATIVE WORK EXPERIENCE

In addition to classroom training and laboratory performance identified on the Career MAP, this student has participated in cooperative work experience with employers as shown below:

Dates _____ Employer _____

Address of Employer _____

Supervisor _____

Supervisor Title _____

Dates _____ Employer _____

Address of Employer _____

Supervisor _____

Supervisor Title _____

Dates _____ Employer _____

Address of Employer _____

Supervisor _____

Supervisor Title _____

NOTES

This section of the MAP is provided so the instructor, employer, or student may list additional qualifying statements or other pertinent information. All comments should be initialed for verification.

State of Florida
Department of Education
Tallahassee, Florida
Betty Castor, Commissioner
Affirmative action/equal opportunity employer

IE571 BK-91